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Southern Pine Beetle Fact Sheet
Number 1

USE OF BEETLE-KILLED TIMBER FOR LUMBER

Can beetle-killed pines be successfully harvested, processed, and marketed? Research offers a "qualified" yes, according to the USDA Expanded Southern Pine Beetle Research and Applications Program. But loggers must act quickly to get trees out of the forest, and mill operators must saw the logs carefully to get the maximum amount of lumber.

Problems of handling beetle-killed timber stem mainly from the wood's loss of moisture. In the forest, dry pines are a fire hazard and may be more dangerous to log . At the mill, beetle-killed timber may dull saws and chipper knives faster. Kiln-drying schedules are also affected, because the widely varying moisture content of beetle kills causes some boards to come out barely dry and others to come out nearly "cooked."

What about lumber yields? Research in Virginia and Texas shows that the lumber recovery factor is a little lower for beetle-killed timber than for green trees. In Virginia, the lumber recovery factor (LRF) was 6.7 for green pine sawtimber and 5.8 for beetle-killed pines which remain standing for 12 months in the forest. In Texas, lumber from green pines had an LRF of 6.4, while beetle-killed timber after 45 days had LRF's of 6.0 (cut-and-left) and 5.7 (standing). Yields from beetle-killed timber decreased with time.

Lumber grade recovery is reduced more than yield. After 90 days in the forest, beetle-killed pines lose a high percentage of No. 2 and better lumber. The percentage of No. 4 lumber increases sharply for standing dead trees after 180 days and 360 days, and for trees cut-and-left 360 days. In dollars, this means that the lumber value of beetle-killed pines dead 45 days is about 95 percent of that from normal green trees; pines dead 90 days have about 79 percent of the value. The lumber value decreases proportionately, thereafter.

Wood toughness is lost, too. After 2 months dead on the stump in Virginia, wood from beetle-killed trees had lost 9 percent of its strength in traditional toughness tests. Trees dead 12 months still had 86 percent of the fracture toughness for green trees and 66 percent of the traditional toughness. In Texas, lumber strength (average modulus of rupture, or MOR) of beetle kills was 94 percent (dead 45 days), 90 percent (dead 90 days), and 87.5 percent (dead 180 to 360 days).

Loss of stiffness is less of a problem than loss of strength. Beetle-killed pines dead 45 days were stiffer than green controls (104.3 percent modulus of elasticity, or MOE), in a Texas experiment. For pines dead 180 to 360 days, MOE was 87 percent that of the controls.

But these problems can be overcome. Loggers can take precautions to ensure their safety while logging beetle-killed trees. Mill operators, by separating beetle kills from green-cut trees, can alleviate most of the processing problems. For more detailed information, consult Agriculture Handbook 555, A Mill Owner's Guide to Profit on Southern Pine Beetle-Killed Trees. Copies are available from your State Forester.

Remember, the wood is definitely marketable. And stumpage prices are often lower for beetle-killed pines than for green-cut trees. The difference in cost may be enough to offset the lower yield and market value of the lumber.

Another important point: For trees dead up to 45 days, the average merchantable weight (wood and bark) is about 73 percent of that for green pines. This means that for mills purchasing by weight, then weight loss—if the trees are harvested within 45 days of their death—would be enough to compensate for reduced LRF and lumber sales value. For trees dead from 90 to 360 days, however, the weight loss would not make up for the loss of higher quality timber.

This fact sheet is based on research by Dr. Geza Ifju, Virginia Polytechnic Institute and State University, and by Mr. DeWayne Weldon and Mr. Earl Walters, Texas Forest Products Laboratory, Texas Forest Service.

The findings are based on research conducted through the USDA Expanded Southern Pine Beetle Research and Applications Program.